

REMARKS

The Office Action mailed June 30, 2005, has been received and reviewed. Claims 1 through 33 are currently pending in the application. Claims 1 through 33 stand rejected. Applicants have amended claims 1, 10 through 12, 26, and 29, and respectfully request reconsideration of the application as amended herein.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent No. 6,465,352 to Aoki et al.

Claims 1 through 16, 20, 22, 24 through 27, 31 and 32 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Aoki et al. (U.S. Patent No. 6,465,352). Applicants respectfully traverse this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Applicants assert that independent claim 1, as currently amended, is not anticipated by Aoki et al. because Aoki et al. does not expressly or inherently describe “exposing at least a portion of the metallic layer to an oxidizing agent, the oxidizing agent **causing an oxidation injury** to the at least a portion of the metallic layer,” and “exposing the metallic layer to a reducing plasma to at least partly **reverse the oxidation injury**.”

Aoki et al. describes a method of removing a resist film and a deposition after a dry-etching is carried out using the resist film as a mask in a semiconductor device fabricating process. Aoki et al., column 1, lines 8-11. Two different methods are described by Aoki et al. A first method is described at column 8, line 43 through column 10, line 35 with reference to FIGS. 7A-7F, and FIG. 9.

As shown in FIG. 7A, Aoki et al. describes a structure that includes copper film 3, a silicon nitride film 4, a hydrogen silsesquioxane (HSQ) film 5, and a resist film 6. Id., column 8, lines 51-67. As shown in FIG. 7B, Aoki et al. describes dry-etching a through-hole 7 in the HSQ

film 5 and the silicon nitride film 4 using an etching gas of mixed CHF_3 and Ar. Id., column 9, lines 6-11. As seen in FIG. 7B, a portion of the copper film 3 is exposed in the through-hole 7. As also seen in FIG. 7B, an etching residue 8 and a resist surface hardened layer 9 on the resist film 6 are formed during formation of the through-hole 7. Id., column 9, lines 11-15. Aoki et al. describes treating the resist surface hardened layer 9 with a hydrogen/nitrogen plasma to convert the resist surface hardened layer 9 to a property-changed resist hardened layer 9A, which can be removed by a resist mover liquid. Id., column 9, lines 16-33.

As a portion of the copper film 3 is exposed in the through-hole 7 when the resist surface hardened layer 9 is treated with a hydrogen/nitrogen plasma, Applicants admit that Aoki et al. inherently describes exposing the copper film 3 to a reducing plasma. Applicants respectfully assert, however, that Aoki et al. does not describe exposing at least a portion of the copper film 3 to an oxidizing agent that causes an oxidation injury to the copper film 3, and exposing the copper film 3 to a reducing plasma to at least partly reverse the oxidation injury. On the contrary, Aoki et al. teaches that “in place of the prior art resist removal by the oxygen plasma ashing, the resist is removed by a combination of the hydrogen/nitrogen plasma treatment and the wet treatment using the resist remover liquid. As a result, the resist film and the deposits can be removed **while preventing the oxidation** of the copper film 3.” Aoki et al., column 9, lines 58-64.

Applicants assert that it may be desirable to form damascene structures in materials that are optimally etched using an oxidizing agent. As discussed at paragraphs [0007], [0039], and [0042] of the as-filed specification for the present invention, oxidizing etchants are conventionally used to remove layers of material, such as, for example, barrier layers. It may be difficult or impossible to etch or remove certain materials using only a hydrogen/nitrogen plasma treatment and a wet treatment, as taught by Aoki et al. Applicants have invented a novel method of forming a damascene structure that allows the use of oxidizing agents to etch certain materials, which may cause an oxidation injury to a metallic layer. As described in the as-filed specification for the present invention, such oxidation injuries can be at least partly reversed by exposing the metallic layer to a reducing plasma, as recited in independent claim 1.

Regarding the second method described by Aoki et al. at column 10, line 35 through

column 12, line 12 with reference to FIGS. 8A-8H, Applicants respectfully assert that Aoki et al. does not describe exposing the copper film 3 to a reducing plasma because the copper film 3 is covered by the silicon nitride film 4 when the resist surface hardened layer 9 is treated with a hydrogen/nitrogen plasma to form the property-changed resist hardened layer 9A, as shown in FIGS. 8B-8C and described at column 10, line 65 – column 11, line 28.

As Aoki et al. does not expressly or inherently describe “exposing at least a portion of the metallic layer to an oxidizing agent, the oxidizing agent causing an oxidation injury to the at least a portion of the metallic layer,” and “exposing the metallic layer to a reducing plasma to at least partly reverse the oxidation injury,” as recited in independent claim 1, Applicants respectfully assert that independent claim 1 is not anticipated by Aoki et al. and request that the Examiner withdraw the rejection of independent claim 1 under 35 U.S.C. § 102(b).

Applicants additionally assert that each of dependent claims 2 through 16, 20, 22, 24, and 25 are allowable because, among other reasons, each depends either directly or indirectly from independent claim 1, which is allowable.

Regarding claims 8 and 9, Applicants additionally assert that Aoki et al. does not describe causing an oxidation injury that comprises formation of copper oxide, or reversing the oxidation injury by reducing the copper oxide to copper. As previously discussed, Aoki et al. merely teaches treating the resist surface hardened layer 9 with a hydrogen/nitrogen plasma to form the property-changed resist hardened layer 9A to prevent oxidation of the copper film 3. Therefore, Applicants respectfully assert that dependent claims 8 and 9 are not anticipated by Aoki et al. and request that the Examiner withdraw the rejection of independent claim 1 under 35 U.S.C. § 102(b) for these additional reasons.

Regarding claim 10, Applicants additionally assert that Aoki et al. does not describe “forming a metallic plug that passes through a first intermetal insulating layer and a second intermetal insulating layer,” as recited in dependent claim 10. Aoki et al. merely describes a plug 22 that passes through a single HSQ film 5. *See Aoki et al.*, FIGS. 7F and 8H. Therefore, Applicants respectfully assert that dependent claim 10 is not anticipated by Aoki et al. and request that the Examiner withdraw the rejection of dependent claim 10 under 35 U.S.C. § 102(b) for this additional reason.

Regarding claim 11, Applicants additionally assert that Aoki et al. does not describe “forming a metallic plug that passes through a first intermetal insulating layer, a second intermetal insulating layer, and a third intermetal insulating layer,” as recited in dependent claim 11. As previously discussed, Aoki et al. merely describes a plug 22 that passes through a single HSQ film 5. *See Aoki et al.*, FIGS. 7F and 8H. Therefore, Applicants respectfully assert that dependent claim 11 is not anticipated by Aoki et al. and request that the Examiner withdraw the rejection of dependent claim 11 under 35 U.S.C. § 102(b) for this additional reason.

Regarding claim 12, Applicants additionally assert that Aoki et al. does not describe “forming a metallic plug that passes through a plurality of intermetal insulating layers,” as recited in dependent claim 12. As previously discussed, Aoki et al. merely describes a plug 22 that passes through a single HSQ film 5. *See Aoki et al.*, FIGS. 7F and 8H. Therefore, Applicants respectfully assert that dependent claim 12 is not anticipated by Aoki et al. and request that the Examiner withdraw the rejection of dependent claim 12 under 35 U.S.C. § 102(b) for this additional reason.

In regards to claims 10 through 12, the Examiner asserts at page 3 of the outstanding Office Action that “it is understood that the processes of figures 7A-7F and 8A-8H may be implemented for a dual or triple damascene structure,” and that “...figures 8A-8H show damascene structures which include a plurality of damascene levels.” Applicants respectfully disagree and request that the Examiner cite to a specific description or teaching in Aoki et al. relating to a dual or triple damascene structure. Applicants respectfully assert that the damascene structures shown in Figures 7A-7F and 8A-8H are merely single damascene structures, as only a plug 22 passes through one HSQ film 5, as shown in FIGS. 7F and 8H.

In regards to claims 13, 14, and 15, the Examiner asserts at page 3 of the outstanding Office Action that “figures 7A-7F and 8A-8H make it clear that the reducing plasma process and the formation of the damascene opening occur in the same environment or chamber....” Applicants respectfully disagree and assert that figures 7A-7F and figures 8A-8H merely illustrate particular structures. Figures 7A-7F and figures 8A-8H in Aoki et al. in no way illustrate or indicate the environment or enclosure in which the structures shown therein are formed. Aoki et al. teaches that the HSQ film 5 and the silicon nitride film 4 are dry-etched to

form the through-hole 7, but no description of the environment or chamber in which the dry-etching is performed is provided. Aoki et al., column 9, lines 6-15. Aoki et al. further teaches that an electron cyclotron resonance plasma machine may be used to treat the resist surface hardened layer 9 with a hydrogen/nitrogen plasma. Id., column 9, lines 16-33. Aoki et al. does not teach, however, dry-etching the through hole 7 in the electron resonance plasma machine that used for the hydrogen/nitrogen plasma treatment. The teachings of Aoki et al. regarding the environment or chamber in which the structures shown in figures 8A-8H are formed are substantially similar to previously discussed teachings relating to figures 7A-7F, and do not teach dry-etching the through hole 7 in the electron resonance plasma machine that used for the hydrogen/nitrogen plasma treatment. Therefore, Applicants respectfully assert that each of dependent claims 13, 14, and 15 are not anticipated by Aoki et al. and request that the Examiner withdraw the rejections of dependent claims 13, 14, and 15 under 35 U.S.C. § 102(b) for these additional reasons.

Applicants assert that independent claims 26, 31, and 32 are not anticipated by Aoki et al. because Aoki et al. does not expressly or inherently describe a metallic damascene structure that includes “an at least partly **reversed oxidation injury** in a metallic layer,” as recited in each of claims 26, 31, and 32.

The teachings of Aoki et al. are discussed above. As previously discussed, Applicants admit that Aoki et al. inherently describes exposing the copper film 3 to a reducing plasma. Applicants respectfully assert, however, that Aoki et al. does not describe exposing at least a portion of the copper film 3 to an oxidizing agent that causes an oxidation injury to the copper film 3, and exposing the copper film 3 to a reducing plasma to at least partly reverse the oxidation injury. On the contrary, Aoki et al. teaches that “in place of the prior art resist removal by the oxygen plasma ashing, the resist is removed by a combination of the hydrogen/nitrogen plasma treatment and the wet treatment using the resist remover liquid. As a result, the resist film and the deposits can be removed **while preventing the oxidation** of the copper film 3.” Aoki et al., column 9, lines 58-64. Therefore, the structures described by Aoki et al. clearly cannot contain an at least partly reversed oxidation injury.

As Aoki et al. does not expressly or inherently describe each of the limitations of independent claims 26, 31, and 32, Applicants respectfully assert that each of independent claims 26, 31, and 32 is not anticipated by Aoki et al. and request that the Examiner withdraw the rejections of independent claims 26, 31, and 32 under 35 U.S.C. § 102(b).

Applicants additionally assert that dependent claim 27 is allowable because, among other reasons, claim 27 depends directly from independent claim 26, which is allowable.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 6,465,352 to Aoki et al.

Claims 17 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Aoki et al. (U.S. Patent No. 6,465,352). Applicants respectfully traverse this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

The 35 U.S.C. § 103(a) obviousness rejections of claims 17 and 18 are improper because Aoki et al. does not teach or suggest “exposing at least a portion of the metallic layer to an oxidizing agent, the oxidizing agent causing an oxidation injury to the at least a portion of the metallic layer,” and “exposing the metallic layer to a reducing plasma to at least partly reverse the oxidation injury,” as recited in independent claim 1 as currently amended, from which each of claims 17 and 18 directly depends.

As previously discussed in relation to independent claim 1, Aoki et al. teaches that “in place of the prior art resist removal by the oxygen plasma ashing, the resist is removed by a combination of the hydrogen/nitrogen plasma treatment and the wet treatment using the resist

remover liquid. As a result, the resist film and the deposits can be removed **while preventing the oxidation** of the copper film 3.” Aoki et al., column 9, lines 58-64. Therefore, Aoki et al. teaches away from exposing at least a portion of the metallic layer to an oxidizing agent. Applicants have invented a novel method of forming a damascene structure that allows the use of oxidizing agents to etch certain materials, which may cause an oxidation injury to a metallic layer, as the oxidation injury may be at least partly reversed by exposing the metallic layer to a reducing plasma, as recited in independent claim 1.

As Aoki et al. fails to teach or suggest each of the limitations of claims 17 and 18, and teaches away from the limitations of claims 17 and 18, Applicants respectfully assert that the inventions of dependent claims 17 and 18 would not have been obvious to one of ordinary skill in the art at the time the inventions were made, and request that the Examiner withdraw the rejection of dependent claims 17 and 18 under 35 U.S.C. § 103(a).

Obviousness Rejection Based on U.S. Patent No. 6,465,352 to Aoki et al.

Claim 19 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Aoki et al. (U.S. Patent No. 6,465,352). Applicants respectfully traverse this rejection, as hereinafter set forth.

The 35 U.S.C. § 103(a) obviousness rejection of claim 19 is improper because, as previously discussed in relation to claims 17 and 18, Aoki et al. does not teach or suggest “exposing at least a portion of the metallic layer to an oxidizing agent, the oxidizing agent causing an oxidation injury to the at least a portion of the metallic layer,” and “exposing the metallic layer to a reducing plasma to at least partly reverse the oxidation injury,” as recited in independent claim 1 as currently amended, from which claim 19 directly depends.

As Aoki et al. fails to teach or suggest each of the limitations of claim 19, and teaches away from the limitations of claim 19, Applicants respectfully assert that the invention of dependent claim 19 would not have been obvious to one of ordinary skill in the art at the time the invention was made, and request that the Examiner withdraw the rejection of dependent claim 19 under 35 U.S.C. § 103(a).

Obviousness Rejection Based on U.S. Patent No. 6,465,352 to Aoki in view of U.S. Patent Publication No. 2001/0034127 to Yamasaki et al.

Claim 21 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Aoki et al. (U.S. Patent No. 6,465,352) in view of Yamasaki et al. (U.S. Patent Publication No. 2001/0034127). Applicants respectfully traverse this rejection, as hereinafter set forth.

The 35 U.S.C. § 103(a) obviousness rejection of claim 21 is improper because none of the cited prior art references teach or suggest “exposing at least a portion of the metallic layer to an oxidizing agent, the oxidizing agent causing an oxidation injury to the at least a portion of the metallic layer,” and “exposing the metallic layer to a reducing plasma to at least partly reverse the oxidation injury,” as recited in independent claim 1 as currently amended, from which claim 21 indirectly depends.

As previously discussed herein, Aoki et al. does not teach or suggest “exposing at least a portion of the metallic layer to an oxidizing agent, the oxidizing agent causing an oxidation injury to the at least a portion of the metallic layer,” and “exposing the metallic layer to a reducing plasma to at least partly reverse the oxidation injury,” as recited in independent claim 1 as currently amended.

Yamasaki et al. teaches the use of tungsten nitride as a diffusion barrier in a damascene structure. Yamasaki et al., page 1, paragraphs [0007] - [0012]. Yamasaki et al. does not, however, teach or suggest “exposing at least a portion of the metallic layer to an oxidizing agent, the oxidizing agent causing an oxidation injury to the at least a portion of the metallic layer,” and “exposing the metallic layer to a reducing plasma to at least partly reverse the oxidation injury,” as recited in independent claim 1 as currently amended.

As Aoki et al. and Yamasaki et al. fail to teach or suggest each of the limitations of claim 21, Applicants respectfully assert that the invention of dependent claim 21 would not have been obvious to one of ordinary skill in the art at the time the invention was made, and request that the Examiner withdraw the rejection of dependent claim 21 under 35 U.S.C. § 103(a).

Obviousness Rejection Based on U.S. Patent No. 6,465,352 to Aoki in view of U.S. Patent No. 6,270,353 to Andrews et al.

Claim 23 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Aoki et al. (U.S. Patent No. 6,465,352) in view of Andrews et al. (U.S. Patent No. 6,270,353). Applicants respectfully traverse this rejection, as hereinafter set forth.

The 35 U.S.C. § 103(a) obviousness rejection of claim 23 is improper because none of the cited prior art references teach or suggest “exposing at least a portion of the metallic layer to an oxidizing agent, the oxidizing agent causing an oxidation injury to the at least a portion of the metallic layer,” and “exposing the metallic layer to a reducing plasma to at least partly reverse the oxidation injury,” as recited in independent claim 1 as currently amended, from which claim 23 indirectly depends.

As previously discussed herein, Aoki et al. does not teach or suggest “exposing at least a portion of the metallic layer to an oxidizing agent, the oxidizing agent causing an oxidation injury to the at least a portion of the metallic layer,” and “exposing the metallic layer to a reducing plasma to at least partly reverse the oxidation injury,” as recited in independent claim 1 as currently amended.

Andrews et al. teaches a method of forming a shallow trench isolation (STI) region on an integrated circuit using non-conformal dielectric material. Andrews et al., column 2, lines 37-39. Andrews et al. teaches that a photo resist may be used in forming the STI region, and that a hydrofluoric-acid containing wet-etch can be used to etch away a high density plasma oxide. Id., column 3, line 62 – column 4, line 9. Andrews et al. does not, however, teach or suggest “exposing at least a portion of the metallic layer to an oxidizing agent, the oxidizing agent causing an oxidation injury to the at least a portion of the metallic layer,” and “exposing the metallic layer to a reducing plasma to at least partly reverse the oxidation injury,” as recited in independent claim 1 as currently amended. Furthermore, Andrews et al. does not teach or suggest applying a wet cleaning process employing aqueous dilute hydrofluoric acid to a **damascene structure**, as recited in dependent claim 23 and independent claim 1, from which claim 23 indirectly depends.

As Aoki et al. and Andrews et al. fail to teach or suggest each of the limitations of claim 23, Applicants respectfully assert that the invention of dependent claim 23 would not have been obvious to one of ordinary skill in the art at the time the invention was made, and request that the

Examiner withdraw the rejection of dependent claim 23 under 35 U.S.C. § 103(a).

Obviousness Rejection Based on U.S. Patent No. 6,465,352 to Aoki et al. in view of U.S. Patent No. 6,424,042 to Kitani and further in view of U.S. Patent Publication No. 2002/0030215 to Oashi et al.

Claim 28 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Aoki et al. (U.S. Patent No. 6,465,352) in view of Kitani (U.S. Patent No. 6,424,042) and further in view of Oashi et al. (U.S. Patent Publication No. 2002/0030215). Applicants respectfully traverse this rejection, as hereinafter set forth.

The 35 U.S.C. § 103(a) obviousness rejection of claim 28 is improper because none of the cited prior art references teach or suggest “an at least partly **reversed oxidation injury** in a metallic layer,” as recited in independent claim 26, from which claim 28 indirectly depends.

As previously discussed herein, Aoki et al. does not teach or suggest an at least partly reversed oxidation injury.

Kitani teaches a method of forming a damascene structure in a semiconductor device. The damascene structure provides an interconnection between interconnection layers in the device. Kitani, column 3, lines 36-44. Certain features of the structure are configured to minimize adverse effects associated with the “dishing” phenomenon. *See Id.*, column 4, line 54 – column 5, line 13. Kitani does not, however, teach or suggest an at least partly reversed oxidation injury as recited in claim 26, from which claim 28 indirectly depends.

Oashi et al. teaches a semiconductor device that includes an integrated circuit having copper wires and copper diffusion blocking means provided in a region surrounding a memory storage portion of the device. Oashi et al., page 1, paragraph [0012] – page 2, paragraph [0013]. Oashi et al. does not, however, teach or suggest a damascene structure that includes an at least partly reversed oxidation injury in a metallic layer, as recited in claim 26, from which claim 28 indirectly depends.

As the cited prior art references fail to teach or suggest each of the limitations of claim 26, from which 28 depends, Applicants respectfully assert that the invention of dependent claim 28 would not have been obvious to one of ordinary skill in the art at the time the invention was

made, and request that the Examiner withdraw the rejection of dependent claim 28 under 35 U.S.C. § 103(a).

Obviousness Rejection Based on U.S. Patent No. 6,885,080 to Chen et al. in view of U.S. Patent Publication No. 2002/0030215 to Oashi et al. and further in view of U.S. Patent No. 6,465,352 to Aoki et al.

Claims 29, 30 and 33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Chen et al. (U.S. Patent No. 6,885,080) in view of Oashi et al. (U.S. Patent Publication No. 2002/0030215) and further in view of Aoki et al. (U.S. Patent No. 6,465,352). Applicants respectfully traverse this rejection, as hereinafter set forth.

The 35 U.S.C. § 103(a) obviousness rejections of independent claims 29 and 33 are improper because none of the cited prior art references teach or suggest a damascene structure comprising “an at least partly **reversed oxidation injury** in a metallic layer,” as recited in each of independent claims 29 and 33.

Chen et al. teaches a device having an integrated circuit that includes a dynamic random access memory (DRAM) array on the same substrate as a microprocessor core or other logic device. Chen et al., column 1, lines 11-14. Chen et al. does not, however, teach or suggest a damascene structure that includes an at least partly reversed oxidation injury in a metallic layer, as recited in each of independent claims 29 and 33.

Oashi et al. teaches a semiconductor device that include an integrated circuit having copper wires and copper diffusion blocking means provided in a region surrounding a memory storage portion of the device. Oashi et al., page 1, paragraph [0012] – page 2, paragraph [0013]. Oashi et al. does not, however, teach or suggest a damascene structure that includes an at least partly reversed oxidation injury in a metallic layer, as recited in each of independent claims 29 and 33.

Regarding Aoki et al., the Examiner asserts at page 8 of the outstanding Office Action that the use of a metallic damascene structure with a partially reversed oxidation injury in a metallic layer is known in the art. Applicants respectfully disagree. As previously discussed herein, Aoki et al. teaches that “in place of the prior art resist removal by the oxygen plasma

ashing, the resist is removed by a combination of the hydrogen/nitrogen plasma treatment and the wet treatment using the resist remover liquid. As a result, the resist film and the deposits can be removed **while preventing the oxidation** of the copper film 3.” Aoki et al., column 9, lines 58-64. Therefore, Aoki et al. teaches away from exposing at least a portion of the metallic layer to an oxidizing agent. Applicants have invented a novel method of forming a damascene structure that allows the use of oxidizing agents to etch certain materials, which may cause an oxidation injury to a metallic layer, as the oxidation injury may be at least partly reversed by exposing the metallic layer to a reducing plasma, as recited in independent claim 1.

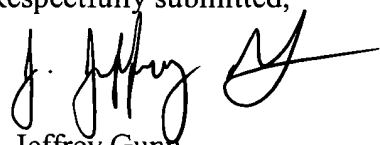
As the cited prior art references fail to teach or suggest each of the limitations of each of independent claims 29 and 33, Applicants respectfully assert that the inventions of independent claims 29 and 33 would not have been obvious to one of ordinary skill in the art at the time the inventions were made, and request that the Examiner withdraw the rejections of independent claims 29 and 33 under 35 U.S.C. § 103(a).

Regarding dependent claim 30, the nonobviousness of independent claim 29 precludes a rejection of claim 30, which depends therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03. Therefore, the Applicants request that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejections to independent claim 29 and to claim 30, which depends therefrom.

CONCLUSION

Claims 1 through 33 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned agent.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'J. Jeffrey Gunn', with a long horizontal flourish extending to the right.

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